



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to:
2003/00513

July 22, 2003

Mr. Robert E. Willis
U.S. Army Corps of Engineers
Chief, Environmental Resources Branch
P.O. Box 2946
Portland, OR 97208-2946

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation on the Effects of the Interstate 84 Riverbank Stabilization Project, Milepost 32.7, Along the Columbia River, Multnomah County, Oregon

Dear Mr. Willis:


Enclosed is a biological opinion (Opinion) pursuant to section 7 of the Endangered Species Act (ESA) prepared by the NOAA's National Marine Fisheries Service (NOAA Fisheries), on the effects of the proposed Interstate 84 Riverbank Stabilization Project, milepost 32.7, along the Columbia River, Multnomah County, Oregon. In this Opinion, NOAA Fisheries concludes that the proposed action is not likely to jeopardize the continued existence of ESA-listed Snake River (SR) sockeye salmon (*Oncorhynchus nerka*), SR fall chinook salmon (*O. tshawytscha*), SR spring/summer chinook salmon, Upper Columbia River (UCR) spring-run chinook salmon, Lower Columbia River (LCR) chinook salmon, Columbia River chum salmon (*O. keta*), SR steelhead (*O. mykiss*), UCR steelhead, Middle Columbia River steelhead, and LCR steelhead. As required by section 7 of the ESA, NOAA Fisheries included reasonable and prudent measures with non-discretionary terms and conditions that NOAA Fisheries believes are necessary to minimize the impact of incidental take associated with this action.

This document also serves as consultation on essential fish habitat for chinook and coho (*O. kisutch*) salmon pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations at 50 CFR Part 600.



If you have any questions regarding this consultation, please contact Art Martin of my staff in the Oregon Habitat Branch at 503.231.6848.

Sincerely,


D. Robert Lohn
Regional Administrator

cc: Molly Cary, ODOT
Diana Hwang, USFWS
Tom Murtag, ODFW

Endangered Species Act - Section 7 Consultation Biological Opinion

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Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation

Interstate 84 Riverbank Stabilization project, Milepost 32.7,
Along the Columbia River,
Multnomah County, Oregon

Agency: U.S. Army Corps of Engineers

Consultation
Conducted By: NOAA's National Marine Fisheries Service,
Northwest Region

Date Issued: July 22, 2003

Issued by: 
D. Robert Lohn
Regional Administrator

Refer to: 2003/00513

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1. INTRODUCTION

1.1 Background

On May 2, 2003, NOAA's National Marine Fisheries Service (NOAA Fisheries) received a request, dated April 30, 2003, including a biological assessment (BA), from the U.S. Army Corps of Engineers (COE) for Endangered Species Act (ESA) section 7 formal consultation and Magnuson-Stevens Fishery Conservation and Management Act (MSA) essential fish habitat (EFH) consultation for the Interstate 84 Riverbank Stabilization Project, milepost 32.7, along the Columbia River, Multnomah County, Oregon.

In the letter and BA, the COE determined that the following 10 listed evolutionarily significant units (ESUs) of Columbia Basin salmonids may occur within the project area, and that the proposed projects are "likely to adversely affect" (LAA) these species or their designated critical habitats: Snake River (SR) sockeye salmon (*Oncorhynchus nerka*), SR spring/summer chinook salmon (*O. tshawytscha*), SR fall-run chinook salmon, Lower Columbia River (LCR) steelhead (*O. mykiss*), Upper Columbia River (UCR) steelhead, SR steelhead, Middle Columbia River (MCR) steelhead, Columbia River (CR) chum salmon (*O. keta*), LCR chinook salmon, and UCR spring-run chinook salmon. References and dates for the listing status, critical habitat designations and ESA section 4(d) take prohibitions of these 10 species are provided in Table 1.

The objective of this consultation is to determine whether the proposed action is likely to jeopardize the continued existence of the ten listed ESUs of Columbia Basin salmonids described above and to complete EFH consultation for chinook and coho salmon (*O. kisutch*). This document is based on the information presented in the BA, site visits, meetings, and discussions with the COE, the Oregon Department of Transportation (ODOT), and the Oregon Department of Fish and Wildlife (ODFW).

1.2 Proposed Action

The proposed action is the construction of 144 linear meters (m) of riprap along the bank of the Columbia River at milepost 32.7 on the shoulder of Interstate 84. Embankment fill for the proposed action would total 3,930 cubic meters (m³) of riprap and quarry waste, including fines for vegetation growth medium within the riprap. Fill and excavation below the 2-year flood elevation for the proposed action will total 1,970 m³ and 80 m³, respectively. A one-lane, temporary access road will be constructed to provide construction access to the project sites. Existing riprap and river bed materials will be removed by backhoe, bulldozer, or similar equipment to excavate a toe trench. Excavated material will be stockpiled at the toe of slope for reincorporation in the final embankment.

Table 1. References for Additional Background on Listing Status, Biological Information, and Critical Habitat Elements for the Listed and Proposed Species Addressed in this Biological Opinion

| Species | Listing Status | Critical Habitat | Protective Regulations | Biological Information, Historical Population Trends |
|--|---|-----------------------------------|-----------------------------------|---|
| Columbia River chum salmon | March 25, 1999; 64 FR 14508, Threatened | N/A | July 10, 2000; 65 FR 42422 | Johnson <i>et al.</i> 1997; Salo 1991 |
| Lower Columbia River steelhead | March 19, 1998; 63 FR 13347, Threatened | N/A | July 10, 2000; 65 FR 42422 | Busby <i>et al.</i> 1995; 1996 |
| Middle Columbia River steelhead | March 25, 1999; 64 FR 14517, Threatened | N/A | July 10, 2000; 65 FR 42422 | Busby <i>et al.</i> 1995; 1996 |
| Upper Columbia River steelhead | August 18, 1997; 62 FR 43937, Endangered | N/A | July 10, 2000; 65 FR 42422 | Busby <i>et al.</i> 1995; 1996 |
| Snake River Basin steelhead | August 18, 1997; 62 FR 43937, Threatened | N/A | July 10, 2000; 65 FR 42422 | Busby <i>et al.</i> 1995; 1996 |
| Snake River sockeye salmon | November 20, 1991; 56 FR 58619, Endangered | December 28, 1993; 58 FR 68543 | November 20, 1991; 56 FR 58619 | Waples <i>et al.</i> 1991a; Burgner 1991 |
| Lower Columbia River chinook salmon | March 24, 1999; 64 FR 14308, Threatened | N/A | July 10, 2000; 65 FR 42422 | Myers <i>et al.</i> 1998; Healey 1991 |
| Upper Columbia River spring-run chinook salmon | March 24, 1999; 64 FR 14308, Endangered | N/A | July 10, 2000; 65 FR 42422 | Myers <i>et al.</i> 1998; Healey 1991 |
| Snake River spring/summer-run chinook salmon | April 22, 1992; 57 FR 14653, Threatened | December 28, 1993; 58 FR 68543 | April 22, 1992; 57 FR 14653 | Matthews and Waples 1991; Healey 1991 |
| Snake River fall chinook salmon | April 22, 1992; 57 FR 14653, Threatened | December 28, 1993; 58 FR 68543 | April 22, 1992; 57 FR 14653 | Waples <i>et al.</i> 1991b; Healey 1991 |

Direct and indirect effects to listed species may occur at the project sites based on: (1) Changes to stream hydraulics; (2) sediment and pollutant discharge; (3) risk of chemical contamination of the aquatic environment; and (4) the extent of riparian habitat modifications. As such, the action area for the proposed activities includes the immediate watershed where the proposed action will occur, and those areas upstream and downstream that may reasonably be affected, temporarily or in the long term. For the purposes of this Opinion, the action area is defined as the streambed, streambank, and riparian corridor along the southern bank of the Columbia River, extending five meters (m) above and below the length of the constructed embankment. The constructed embankment is at approximately mile point 32.7 along Interstate 84, and at approximately river mile 136.5 of the Columbia River.

No construction equipment will enter the flowing water and no construction will occur in the water. No construction material will be allowed to enter the water and excavated material will be removed during low water when sediments are exposed. The estimated construction window is August 7, 2003, through September 10, 2003.

1.2.1 Live Planting Embankment Features

Although a bioengineered embankment was considered during development of the proposed action, site-specific constraints such as extreme weather conditions, fluctuation of river level, slope steepness, river velocities, wind, and barge wave energy limit the effectiveness of traditional bioengineered solutions. An irregular riprap bank line will be constructed, incorporating the following bioengineered features: (1) Construction of planting mounds at the base of the bank protected slope which will be planted with willows; (2) large trees with rootwads; (3) willow wattles, one meter riverward of the toe of the slope; (4) planting of a single layer of willow/red osier dogwood cuttings at approximate elevation 6 m; and (5) planting of rooted cuttings of upland native shrubs on the slope. Willow cuttings will include Hooker willow, Piper's willow, Sitka willow, and creek (red-osier) dogwood. Slope planting will include a variety on native species.

1.2.2 Large Woody Debris Placement

The proposed action includes placement of large woody debris (large conifer trees) at alternating planting mounds described in section 1.2.1 above. Each set of trees will be anchored with buried concrete blocks and will be greater than or equal to 0.6 m diameter breast height and would have a complex rootwad greater than or equal to 2.4 m in diameter. The large woody debris placements will be angled upstream to assure wave action perpendicular to the trunk maximizing placement and embankment stability. The intent of including large wood elements in the project design is to enhance opportunity for fish use and the quality of fish habitat along the modified embankment.

2. ENDANGERED SPECIES ACT

2.1 Biological Opinion

2.1.1 Biological Information

Essential features of salmonid habitat required for the survival and recovery of listed species are water quality, water quantity, water temperature, water velocity, substrate, cover/shelter, food, space, and safe passage conditions (NMFS 1996). Together, these factors determine the biotic composition, structure, function, and stability of aquatic and riparian ecosystems and their ability to support the biological requirements of the species (Spence *et al.* 1996).

Pacific anadromous salmonid populations in the Pacific Northwest have evolved under the unimpaired flow regimes historically provided by their natal streams. The flow regimes reflect the dynamic character of fluvial systems, which is determined by the quantity, timing and natural variability of stream flow. These characteristics drive many of the physical processes in watersheds that are important to salmonid survival and conservation. Unimpaired flow regimes benefit salmonids in two critical ways: (1) They provide temporally and spatially appropriate water quantities to support specific life stages; and (2) they ensure self-sustaining ecosystem processes by which salmonid habitat is created and maintained over time.

Dynamic hydraulic, geomorphic, and ecologic processes must be maintained to provide salmonids a high probability of access to sufficient quantities of quality habitats for timely and successful completion of each and every life stage in freshwater (Bisson *et al.* 1997). However, given inter-annual hydrologic variability, even under an unimpaired flow regime, the quantity and quality of freshwater habitat necessary to obtain food and grow, escape predation, resist disease, migrate, and survive extreme environmental events is highly variable and can readily become limiting (Bjornn and Reiser 1991). Stream-rearing salmonids must survive extended periods in freshwater through winter and summer rearing bottlenecks (Bjornn and Reiser 1991). In addition, environmental conditions during extensive downstream and upstream migrations during juvenile and smolt life stages and again during adult and pre-spawning life stages can also significantly limit survival.

2.1.2 Evaluating Proposed Action

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 CFR Part 402 (the consultation regulations). NOAA Fisheries must determine whether the action is likely to jeopardize the listed species. This analysis involves the initial steps of defining the biological requirements and current status of the listed species, and evaluating the relevance of the environmental baseline to the species' current status. Subsequently, NOAA Fisheries evaluates whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for recovery. In making this determination, NOAA Fisheries must consider the estimated level of mortality attributable to: (1) Collective effects of the proposed or continuing action; (2) the environmental baseline; and

(3) any cumulative effects. This evaluation must take into account measures for survival and recovery specific to the listed salmonid's life stages that occur beyond the action area. If NOAA Fisheries finds that the action is likely to jeopardize the listed species, NOAA Fisheries must identify reasonable and prudent alternatives for the action. For the proposed action, NOAA Fisheries' jeopardy analysis considers direct or indirect mortality of fish attributable to the action.

2.1.3 Biological Requirements

The first step in the method NOAA Fisheries uses for applying the ESA section 7(a)(2) to listed salmon is to define the biological requirements of the species most relevant to each consultation. NOAA Fisheries also considers the current status of the listed species by taking into account population size, trends, distribution and genetic diversity. To assess the current status of the listed species, NOAA Fisheries starts with the determinations made in its decision to list the 10 Columbia Basin ESU salmonids for ESA protection and also considers new data available that are relevant to the determination.

The relevant biological requirements are those necessary for the ten Columbia Basin ESU salmonids to survive and recover to naturally-reproducing population levels, at which time protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance their capacity to adapt to various environmental conditions, and allow them to become self-sustaining in the natural environment.

For this consultation, the biological requirements are habitat characteristics that function to support successful spawning, rearing and migration. These involve adequate fish passage, water quality, water quantity, substrate, shade and cover. Because the current status of the ten Columbia Basin ESU salmonids, based upon their risk of extinction, has not significantly improved since the species were listed, adverse impacts to these biological requirements have the potential to be significant.

2.1.4 Environmental Baseline

The most recent evaluation of the environmental baseline for the Columbia River is part of the NOAA Fisheries's Opinion for the Federal Columbia River Power System (FCRPS) issued in December 2000. This Opinion assessed the entire Columbia River system below Chief Joseph Dam and downstream to the farthest point (the Columbia River estuary and nearshore ocean environment) at which listed salmonids are influenced. For a detailed evaluation of the environmental baseline of the Columbia River basin please refer to the FCRPS Opinion (NMFS 2000).

The quality and quantity of freshwater habitats in much of the Columbia River basin have declined dramatically in the last 150 years. Forestry, farming, grazing, road construction, hydrosystem development, mining, and urbanization have radically changed the historical habitat conditions of the basin.

Water quality in streams throughout the Columbia River basin has been degraded by human activities such as dams and diversion structures, water withdrawals, farming and grazing, road construction, timber harvest activities, mining activities, and urbanization. Sediment and contaminants from the tributaries settle in mainstem reaches and the estuary and contribute to poor water quality. Temperature alterations affect salmonid metabolism, growth rate, spawning success, and disease resistance, as well as the timing of adult migrations, fry emergence, and smoltification. Many factors can cause high stream temperatures, but they are primarily related to land-use practices rather than point-source discharges. Loss of wetlands and increases in groundwater withdrawals have contributed to lower base-stream flows, which in turn contribute to temperature increases. Channel widening and land uses that create shallower streams also cause temperature increases.

Pollutants also degrade water quality. Salmon require clean gravel for successful spawning, egg incubation, and emergence of fry. Fine sediments clog the spaces between gravel and restrict the flow of oxygen-rich water to the incubating eggs. Excess nutrients, low concentrations of dissolved oxygen, heavy metals, and changes in pH also directly affect the water quality for salmon and steelhead.

Water quantity problems are also a significant cause of habitat degradation and reduced fish production. Withdrawing water for irrigation, urban, and other uses can increase temperatures, smolt travel time, and sedimentation. Return water from irrigated fields can introduce nutrients and pesticides into streams and rivers. On a larger landscape scale, human activities have affected the timing and amount of peak water runoff from rain and snowmelt. Many riparian areas, flood plains, and wetlands that once stored water during periods of high runoff have been developed. Urbanization paves over or compacts soil and alters the volume and timing of runoff reaching rivers and streams.

The Columbia River estuary also has been changed by human activities. Historically, the downstream half of the estuary was a dynamic environment with multiple channels, extensive wetlands, sandbars, and shallow areas. The mouth of the Columbia River was about four miles wide. Today, navigation channels have been dredged, deepened and maintained, jetties and pile-dike fields have been constructed to stabilize and concentrate flow in navigation channels, marsh and riparian habitats have been filled and diked, and causeways have been constructed across waterways. These actions have decreased the width of the mouth of the Columbia River to two miles, and increased the depth of the Columbia River channel at the bar from less than 20 to more than 55 feet.

In the action area for the proposed project, near River Miles 136.5, the environmental baseline has been further degraded by human activity. This area consists of constructed highway

embankments in various states of failure along the Oregon shore. The riparian area in this reach of the Columbia River contains little cover and vegetation. The development of this area contributes to the degraded conditions of the Columbia River including reduced water quality, increased water temperature, altered timing and quantity of runoff, and decreased riparian cover and habitat refugia.

2.1.5 Analysis of Effects

2.1.5.1 Effects of Proposed Action

Creeks and rivers are dynamic systems that naturally alter their courses in response to many physical processes. Roadways and other structures constructed along waterways are subject to flooding and undercutting as a result of these natural changes in the stream course. Structural hardening of embankments is the traditional means of protecting these structures along waterways.

Hardened embankments simplify stream channels, alter hydraulic processes, and prevent natural channel adjustments (Spence *et al.* 1996). Moreover, embankment hardening may shift the erosion point either upstream or downstream of the project site and contribute to stream velocity acceleration. As amplified erosive forces attack different locations and landowners respond with more bank hardening, the river eventually attains a continuous fixed alignment lacking habitat complexity (USACE 1977).

Fish habitats are enhanced by the diversity of habitats at the land-water interface and adjacent bank (USACE 1977). Streamside vegetation provides shade that reduces water temperature. Overhanging branches provide cover from predators. Insects and other invertebrates that fall from overhanging branches may be preyed upon by fish, or provide food sources for other prey organisms. Immersed vegetation, logs, and root wads provide points of attachment for aquatic prey organisms, create shelter from swift currents during high flow events, retain bed load materials, create pools, and reduce flow velocity.

The most desirable method of bank protection is revegetation. However, revegetation alone can seldom stabilize banks steeper than 3:1 (horizontal:vertical) or areas of high velocity and wave action (USACE 1977). Although they are biologically less desirable, fixed structures provide the most reliable means of bank stability. The use of structural measures should be a last resort. Combining structural measures such as sloped riprap or mechanically stabilized earth walls, vegetation and large woody material (LWM) is preferable to a structural solution without vegetation (USACE 1977).

Sedimentation

Potential impacts to listed salmonids from the proposed action include both direct and indirect effects. Potential direct effects include mortality from exposure to suspended sediments (turbidity) and contaminants resulting from construction. Potential indirect effects include

behavioral changes resulting from elevated turbidity level (Sigler *et al.* 1984, Berg and Northcote 1985, Whitman *et al.* 1982, Gregory 1988), during river bank habitat alterations.

Suspended sediment and turbidity influences on fish reported in the literature range from beneficial to detrimental. Elevated total suspended solids (TSS) conditions have been reported to enhance cover conditions, reduce piscivorous fish/bird predation rates, and improve survival. Elevated TSS conditions have also been reported to cause physiological stress, reduce growth, and adversely affect survival. Of key importance in considering the detrimental effects of TSS on fish are the frequency and the duration of the exposure, not just the TSS concentration.

Behavioral avoidance of turbid waters may be one of the most important effects of suspended sediments (DeVore *et al.* 1980, Birtwell *et al.* 1984, Scannell 1988). Salmonids have been observed to move laterally and downstream to avoid turbid plumes (Sigler *et al.* 1984, Lloyd 1987, Scannell 1988, Servizi and Martens 1991). Juvenile salmonids tend to avoid streams that are chronically turbid, such as glacial streams or those disturbed by human activities, unless the fish need to traverse these streams along migration routes (Lloyd *et al.* 1987). In addition, a potentially positive reported effect is providing refuge and cover from predation (Gregory and Levings 1998).

Fish that remain in turbid, or elevated TSS, waters experience a reduction in predation from piscivorous fish and birds (Gregory and Levings 1998). In systems with intense predation pressure, this provides a beneficial trade off (*e.g.*, enhanced survival) to the cost of potential physical effects (*e.g.*, reduced growth). Turbidity levels of about 23 Nephelometric Turbidity Units (NTU) have been found to minimize bird and fish predation risks (Gregory 1993). Exposure duration is a critical determinant of the occurrence and importance of physical or behavioral effects (Newcombe and MacDonald 1991). Salmonids have evolved in systems that periodically experience short-term pulses (days to weeks) of high suspended sediment loads, often associated with flood events, and are adapted to such high pulse exposures. Adult and larger juvenile salmonids may be little affected by the high concentrations of suspended sediments that occur during storm and snowmelt runoff episodes (Bjornn and Reiser 1991). However, research shows that chronic exposure can cause physiological stress responses that can increase maintenance energy and reduce feeding and growth (Redding *et al.* 1987, Lloyd 1987, Servizi and Martens 1991).

Turbidity, at moderate levels, has the potential to adversely affect primary and secondary productivity, and at high levels, has the potential to injure and kill adult and juvenile fish, and may also interfere with feeding (Spence *et al.* 1996). Newly-emerged salmonid fry may be vulnerable to even moderate amounts of turbidity (Bjornn and Reiser 1991). Other behavioral effects on fish, such as gill flaring and feeding changes, have been observed in response to pulses of suspended sediment (Berg and Northcote 1985). Fine redeposited sediments also have the potential to adversely affect primary and secondary productivity (Spence *et al.* 1996), and to reduce incubation success (Bell 1991) and cover for juvenile salmonids (Bjornn and Reiser 1991). Because the potential for turbidity should be localized and brief, the probability of direct mortality is negligible.

Chemical Contamination

As with all construction activities, accidental release of fuel, oil, and other contaminants may occur. Operation of the back-hoes, excavators, and other equipment requires the use of fuel, lubricants, *etc.*, which, if spilled into the channel of a water body or into the adjacent riparian zone, can injure or kill aquatic organisms. Petroleum-based contaminants (such as fuel, oil, and some hydraulic fluids) contain poly-cyclic aromatic hydrocarbons (PAHs), which can be acutely toxic to salmonids at high levels of exposure and can also cause chronic lethal and acute and chronic sublethal effects to aquatic organisms (Neff 1985). Similarly, exposure to herbicides can have lethal and sublethal effects on salmonids, aquatic invertebrates, aquatic vegetation, and target and non target riparian vegetation (Spence *et al.* 1996).

Construction-related effects necessary to complete the proposed action will be minimized by completing the in-water work during low flow periods. No construction or construction equipment will enter the flowing water as a result of the proposed action.

Vegetation Removal

The construction of an access road and embankment construction will result in some native and non-native riparian vegetation removal. Minor amounts of riparian vegetation will be lost because of this project, since little currently exists in the project area. Extensive willow plantings will help to offset the loss of any functional benefits associated with necessary vegetation removal. Temporary increases in water temperature may result as a result of vegetation removal.

Space

The proposed action will result in the modification of 0.42 acres of bankline below the two-year flood elevation. However, the finished embankment will result in a net increase of 26 m in total length of shoreline. Habitat complexity and quality will improve as a result of incorporation of planting mounds, large coniferous trees with rootwads attached and extensive willow plantings along the finished embankment. The increase in shoreline length, and habitat complexity and quality is expected to result in a long-term beneficial affect on anadromous salmonid migration and rearing habitat at the project sites.

2.1.5.2 Effects on Critical Habitat

NOAA Fisheries designates critical habitat based on physical and biological features that are essential to the listed species. Essential features for designated critical habitat include substrate, water quality, water quantity, water temperature, food, riparian vegetation, access, water velocity, space and safe passage. Effects on critical habitat from the proposed action are included in the effects description above.

2.1.5.3 Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as those effects of “future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action

area of the Federal action subject to consultation.” Future Federal actions, including the ongoing operation of hydropower systems, hatcheries, fisheries, and land management activities are being (or have been) reviewed through separate section 7 consultation processes. Therefore, these actions are not considered cumulative to the proposed actions.

NOAA Fisheries is not aware of any specific future non-federal activities within the action area that would cause greater impacts to listed species than presently occurs. However, development of structures and vegetation clearing along the streams is likely to continue. The NOAA Fisheries assumes that future private and state actions will continue at similar intensities as in recent years.

2.1.6 Conclusion

NOAA Fisheries has determined, based on the available information, that the proposed action covered in this Opinion is not likely to jeopardize the continued existence of listed salmonids or adversely modify critical habitats. NOAA Fisheries used the best available scientific and commercial data to apply its jeopardy analysis, when analyzing the effects of the proposed actions on the biological requirements of the species relative to the environmental baseline, together with cumulative effects. The proposed action would cause a minor, short-term degradation of anadromous salmonid habitat due to turbidity caused by fill and excavation below the ordinary high water mark elevation. NOAA Fisheries does not expect direct mortality to listed salmonids from the proposed action. The proposed action not is likely to impair properly functioning habitat, appreciably reduce the functioning of already impaired habitat, or retard the long term progress of impaired habitat toward proper functioning condition essential to the long-term survival and recovery at the population or ESU scale.

2.1.7 Reinitiation of Consultation

This concludes formal consultation on the proposed Interstate 84 Riverbank Stabilization Project, Milepost 32.7 Project. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) The amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this Opinion; or (4) a new species is listed or critical habitat is designated that may be affected by the action. In instances where the amount or extent of authorized incidental take is exceeded, any operations causing such take must cease pending reinitiation of consultation.

If the COE fails to provide the specified annual monitoring information, NOAA Fisheries would consider that a modification of the action that causes an effect on listed species not previously considered and would cause this Opinion to expire. To reinitiate consultation, contact the

Habitat Conservation Division (Oregon Habitat Branch) of NOAA Fisheries and refer to 2003/00513.

2.2 Incidental Take Statement

Section 9 and rules promulgated under section 4(d) of the ESA prohibit any taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct) of listed species without a specific permit or exemption. “Harm” is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, and sheltering. “Harass” is defined as actions that create the likelihood of injuring listed species to by annoying it to such an extent as to significantly alter normal behavior patterns which include, but are not limited to, breeding, feeding, and sheltering. “Incidental take” is take of listed animal species that results from, but is not the purpose of, the Federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

An incidental take statement specifies the impact of any incidental taking of listed species. It also provides reasonable and prudent measures that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply to implement the reasonable and prudent measures.

2.2.1 Amount or Extent of the Take

NOAA Fisheries anticipates that the action covered by this Opinion is reasonably certain to result in incidental take of listed salmonids because of detrimental effects from increased turbidity levels and indirect effects from alteration of critical habitat features. Effects of the action covered by this Opinion are largely unquantifiable in the short term, and are not expected to be measurable as long-term adverse effects on habitat or population levels. Therefore, even though NOAA Fisheries expects some minor level of incidental take to occur due to the action covered by this Opinion, the best scientific and commercial data available are not sufficient to enable NOAA Fisheries to estimate a specific amount of incidental take to the species itself. In instances such as these, the NOAA Fisheries quantifies the extent of take or habitat alteration. Based on the information provided by the COE and other available information, NOAA Fisheries anticipates that habitat alteration would occur to 144 m of streambank as a result of the action covered by this Opinion. The extent of the take is limited to the action area as define in section 1.2 above. The extent of authorized take is limited to the 10 listed Columbia basin ESU salmonids and their habitats, and is limited to that caused by the proposed action.

2.2.2 Reasonable and Prudent Measures

The measures described below are non-discretionary. They must be implemented so that they become binding conditions in order for the exemption in section 7(a)(2) to apply. The COE has

the continuing duty to regulate the activities covered in this incidental take statement. If the COE fails to adhere to the terms and conditions of the incidental take statement through enforceable terms added to the document authorizing this action, or fails to retain the oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(a)(2) may lapse.

NOAA Fisheries believes that the following reasonable and prudent measures are necessary and appropriate to minimize take of the above species. The COE shall:

1. Minimize the likelihood of incidental take from streambank and shoreline protection actions by directing the contractor to use an approach that maximizes ecological functions and the best available bioengineering technology.
2. Minimize the likelihood of incidental take from activities involving temporary access roads, use of heavy equipment, earthwork, site restoration, or that may otherwise involve in-water work or affect fish passage by directing the contractor to avoid or minimize disturbance to riparian and aquatic systems.
3. Minimize the likelihood of incidental take from in-water work activities by ensuring that the in-water work activities (toe trench excavation and scour protection placement) are isolated from flowing water.
4. Complete a comprehensive monitoring and reporting program to ensure implementation of these conservation measures are effective in minimizing the likelihood of take from permitted activities.

2.2.3 Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the COE must comply with the following terms and conditions, which implement the reasonable and prudent measures described above for each category of activity.

1. To implement reasonable and prudent measure #1 (streambank protection), the COE shall ensure that:
 - a. The use of rock and riprap is minimized.
 - b. Rock will be individually placed in a way that produces an irregularly contoured face to provide velocity disruption. No end dumping will be allowed.
 - c. Any instream large wood or riparian vegetation that is moved or altered during construction will stay on site or be replaced with a functional equivalent.
 - d. The bankline will be revegetated using native vegetation appropriate for the site conditions.

2. To implement reasonable and prudent measure #2 (construction), the COE shall ensure that:
- a. Project design. Alteration or disturbance of the streambanks and existing riparian vegetation will be minimized.
 - b. In-water work. All work within the active channel will be completed within the low flow period, no construction equipment will enter the flowing water, and no construction will occur in the water.
 - c. Pollution and erosion control plan. A pollution and erosion control plan (PECP) will be developed for the project to prevent point-source pollution related to construction operations. The PECP will contain the pertinent elements listed below, and will meet requirements of all applicable laws and regulations.
 - i. Methods that will be used to prevent erosion and sedimentation associated with access roads, construction sites, equipment and material storage sites, fueling operations and staging areas.
 - ii. A description of the hazardous products or materials that will be used, including inventory, storage, handling, and monitoring.
 - iii. A spill containment and control plan with notification procedures, specific clean up and disposal instructions for different products, quick response containment and clean up measures that will be available on site, proposed methods for disposal of spilled materials, and employee training for spill containment.
 - iv. Measures that will be taken to prevent construction debris from falling into any aquatic habitat. Any material that falls into a stream during construction operations will be removed in a manner that has a minimum impact on the streambed and water quality.
 - d. Pre-construction activities. Before significant alteration of the action area, the following actions will be accomplished:
 - i. Boundaries of the clearing limits associated with site access and construction are flagged to prevent ground disturbance of critical riparian vegetation, wetlands and other sensitive sites beyond the flagged boundary.
 - ii. A supply of erosion control materials (*e.g.*, silt fence, straw bales) is on hand to respond to sediment emergencies. Sterile straw or hay bales will be used when available to prevent introduction of weeds.
 - iii. All temporary erosion controls (*e.g.*, straw bales, silt fences) are in place and appropriately installed downslope of project activities within the riparian area. Effective erosion control measures will be in place at all times during the contract, and will remain and be maintained until such time that permanent erosion control measures are effective.
 - e. Earthwork. Earthwork, including excavation, filling and compacting, is completed in the following manner:
 - i. Boulders, rock, woody materials and other natural construction materials used for the project must be obtained from outside of the riparian area.

- ii. Material removed during excavation will only be placed in locations where it cannot enter streams or other waterbodies.
- iii. All exposed or disturbed areas will be stabilized to prevent erosion.
 - (1) Areas of bare soil within 150 feet of waterways, wetlands or other sensitive areas will be stabilized by native seeding,¹ mulching, and placement of erosion control blankets and mats, if applicable, quickly as reasonable after exposure, but within seven days of exposure.
 - (2) All other areas will be stabilized as quickly as reasonable, but within 14 days of exposure.
 - (3) Seeding outside of the growing season will not be considered adequate for permanent stabilization.
- f. Heavy Equipment. Heavy equipment use will be fueled, maintained and stored as follows:
 - i. Vehicle staging, maintenance, refueling, and fuel storage areas will be a minimum of 150 feet horizontal distance from any stream.
 - ii. All vehicles operated within 150 feet of any stream or waterbody will be inspected daily for fluid leaks before leaving the vehicle staging area. Any leaks detected will be repaired before the vehicle resumes operation.
 - iii. When not in use, vehicles will be stored in the vehicle staging area.
- g. Site restoration. Site restoration and clean-up, including protection of bare earth by seeding, planting, mulching and fertilizing, will be done in the following manner:
 - i. Disturbed areas will be planted with native vegetation specific to the project vicinity or the region of the state where the project is located, and will comprise a diverse assemblage of woody and herbaceous species.
 - ii. No herbicide application will occur as part of this permitted action. Mechanical removal of undesired vegetation and root nodes is permitted.
 - iii. No surface application of fertilizer will be used within 50 feet of any stream channel as part of this permitted action.
 - iv. Plantings will achieve an 80% survival or 80% cover success after five years within the natural vegetation zone at the project site.
 - (1) If success standard has not been achieved after five years, the applicant will submit an alternative plan to NOAA Fisheries. The alternative plan will address temporal loss of function.
 - (2) Plant establishment monitoring will continue and plans will be submitted to the NOAA Fisheries until site restoration success has been achieved.

¹ By Executive Order 13112 (February 3, 1999), Federal agencies are not authorized to permit, fund or carry out actions that are likely to cause, or promote, the introduction or spread of invasive species. Therefore, only native vegetation that is indigenous to the project vicinity, or the region of the state where the project is located, shall be used.

3. To implement reasonable and prudent measure #3 (in-water work area activities) the COE shall ensure that the in-water work activities (toe trench excavation and scour protection placement) are isolated from flowing water.
4. To implement reasonable and prudent measure #4 (monitoring and reporting), the COE shall ensure that:
 - a. Within 120 days of completing the project, the COE shall ensure submittal of a monitoring report to NOAA Fisheries describing the COE's success meeting their permit conditions. This report will consist of the following information:
 - i. Project identification.
 - (1) Project name.
 - (2) Starting and ending dates of work completed for this project.
 - (3) The COE contact person.
 - ii. Pollution and erosion control. A summary of all pollution and erosion control inspection reports, including descriptions of any failures experienced with erosion control measures, efforts made to correct them and a description of any accidental spills of hazardous materials.
 - iii. Site conditions. Documentation of the finished project contours and habitat conditions.
 - iv. Photographic documentation of environmental conditions at the project site before, during and after project completion.
 - (1) Photographs will include general project location views and close-ups showing details of the project area and project, including pre- and post-construction.
 - (2) Each photograph will be labeled with the date, time, photo point, project name, the name of the photographer, and a comment describing the photograph's subject.
 - (3) Relevant habitat conditions include characteristics the modified embankment, riparian vegetation (including planting mounds and other revegetation strategies), large wood placements, and other visually discernable environmental conditions at the project area, and upstream and downstream of the project.
 - b. On an annual basis and for five years following the completion the proposed action, the COE shall ensure submittal of an annual monitoring report to NOAA Fisheries describing the results of the COE's proposed site restoration and habitat enhancement efforts and monitoring activities. This report will consist of the following information:
 - i. Project identification.
 - (1) Project name.
 - (2) Starting and ending dates of work completed for this project.
 - (3) The COE contact person.
 - ii. Site conditions. Documentation of the following conditions:
 - (1) The results of the site restoration and replanting success.

- (2) The results of the habitat enhancement features of the embankment effort.
 - (3) Photo documentation of the embankment, each specific planting mound and associated large wood placements, riparian vegetation including willow plantings and habitat conditions along the embankment at various representative locations within the project area.
- iii. Submit monitoring reports to:
 - NOAA Fisheries
 - Oregon Habitat Branch, Habitat Conservation Division
 - Attn: 2003/00513**
 - 525 NE Oregon Street, Suite 500
 - Portland, OR 97232-2778
- c. If a dead, injured, or sick endangered or threatened species specimen is found, initial notification must be made to the NOAA Fisheries' Law Enforcement Office, Vancouver Field Office, 600 Maritime, Suite 130, Vancouver, Washington 98661; phone: 360.418.4246. Care will be taken in handling sick or injured specimens to ensure effective treatment and care or the handling of dead specimens to preserve biological material in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered and threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

3. MAGNUSON-STEVENSON ACT

3.1 Background

The objective of the essential fish habitat (EFH) consultation is to determine whether the proposed actions may adversely affect designated EFH for relevant species, and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH resulting from the proposed actions.

3.2 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-297), requires the inclusion of EFH descriptions in Federal fishery management plans. In addition, the MSA requires Federal agencies to consult with NOAA Fisheries on activities that may adversely affect EFH.

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting the definition of essential fish habitat: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and “spawning, breeding, feeding, or growth to maturity” covers a species' full life cycle (50CFR600.110).

Section 305(b) of the MSA (16 U.S.C. 1855(b)) requires that:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH.
- NOAA Fisheries shall provide conservation recommendations for any Federal or state activity that may adversely affect EFH.
- Federal agencies shall within 30 days after receiving conservation recommendations from NOAA Fisheries provide a detailed response in writing to NOAA Fisheries regarding the conservation recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NOAA Fisheries, the Federal agency shall explain its reasons for not following the recommendations.

The MSA requires consultation for all actions that may adversely affect EFH, and does not distinguish between actions within EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and upslope activities, that may have an adverse effect on EFH. Therefore, EFH consultation with NOAA Fisheries is required by Federal agencies undertaking, permitting or funding activities that may adversely affect EFH, regardless of its location.

3.3 Identification of EFH

The Pacific Fisheries Management Council (PFMC) has designated EFH for federally-managed fisheries within the waters of Washington, Oregon, and California. The designated EFH for groundfish and coastal pelagic species encompasses all waters from the mean high water line, and upriver extent of saltwater intrusion in river mouths, along the coasts of Washington, Oregon and California, seaward to the boundary of the U.S. exclusive economic zone (370.4 km)(PFMC 1998a, 1998b). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years) (PFMC 1999). In estuarine and marine areas,

designated salmon EFH extends from the nearshore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone (370.4 km) offshore of Washington, Oregon, and California north of Point Conception to the Canadian border.

Detailed descriptions and identifications of EFH for the groundfish species are found in the Final Environmental Assessment/Regulatory Impact Review for Amendment 11 to *The Pacific Coast Groundfish Management Plan* (PFMC 1998a) and the NOAA Fisheries *Essential Fish Habitat for West Coast Groundfish Appendix* (Casillas *et al.* 1998). Detailed descriptions and identifications of EFH for the coastal pelagic species are found in Amendment 8 to the *Coastal Pelagic Species Fishery Management Plan* (PFMC 1998b). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the *Pacific Coast Salmon Plan* (PFMC 1999). Assessment of the potential adverse effects to these species' EFH from the proposed actions is based on this information.

3.4 Proposed Actions

The proposed action is detailed above in section 1.2. The action area includes designated critical habitat affected by the proposed action within the Columbia River. This area has been designated as EFH for various life stages of chinook and coho salmon and starry flounder (*Platyichthys stellatus*).

3.5 Effects of Proposed Action

As described in detail in section 2.1.5 of this document, the proposed activities may result in short-term adverse effects to water quality (sediment and chemical contamination). Long-term beneficial effects are likely from a longer, more complex bank line and improved hydraulic conditions along the new embankment.

3.6 Conclusion

NOAA Fisheries believes that the proposed actions will adversely affect the EFH for Pacific salmon species and starry flounder (*Platyichthys stellatus*).

3.7 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations for any Federal or state agency action that would adversely affect EFH. The conservation measures proposed for the project by the COE and all of the reasonable and prudent measures and the terms and conditions contained in sections 2.2 and 2.3, respectively, are applicable to EFH. Therefore, NOAA Fisheries incorporates each of those measures here as EFH conservation recommendations.

3.8 Statutory Response Requirement

Please note that the MSA (section 305(b)) and 50 CFR 600.920(j) requires the Federal agency to provide a written response to NOAA Fisheries after receiving EFH conservation recommendations within 30 days of its receipt of this letter. This response must include a description of measures proposed by the agency to avoid, minimize, mitigate or offset the adverse impacts of the activity on EFH. If the response is inconsistent with a conservation recommendation from NOAA Fisheries, the agency must explain its reasons for not following the recommendation.

3.9 Consultation Renewal

The COE must reinitiate EFH consultation with NOAA Fisheries if either action is substantially revised or new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920).

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